



SEQUENCE LISTING

<110> CASTILLO, GERARDO M.  
NGUYEN, BETH P.  
LAKE, THOMAS P.  
SNOW, ALAN D.

<120> SMALL PEPTIDES FOR THE TREATMENT OF ALZHEIMER'S DISEASE  
AND OTHER BETA-AMYLOID PROTEIN FIBRILLOGENESIS  
DISORDERS

<130> PROTEO.P03CI2

<140> 10/821,250  
<141> 2004-04-08

<150> 60/461,655  
<151> 2003-04-08

<150> 09/962,955  
<151> 2001-09-24

<150> 09/938,275  
<151> 2001-08-22

<150> 08/947,057  
<151> 1997-10-08

<160> 108

<170> PatentIn Ver. 3.2

<210> 1  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 1  
Arg Lys Arg Leu Gln Val Gln Leu Ser Ile Arg Thr  
1 5 10

<210> 2  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic

peptide

<400> 2

Lys Ala Phe Asp Ile Thr Tyr Val Arg Leu Lys Phe  
1 5 10

<210> 3

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 3

Arg Gln Val Phe Gln Val Ala Tyr Ile Ile Ile Lys Ala  
1 5 10

<210> 4

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 4

His Gln Thr Trp Thr Arg Asn Leu Gln Val Thr Leu  
1 5 10

<210> 5

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 5

Ile Ser Asn Val Phe Val Gln Arg Leu Ser Leu Ser  
1 5 10

<210> 6

<211> 12

<212> PRT

<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 6  
Ala Ser Pro Pro Ser Val Lys Val Trp Gln Asp Ala  
1 5 10

<210> 7  
<211> 13  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 7  
Arg Gly Leu Val Phe His Thr Gly Thr Lys Asn Ser Phe  
1 5 10

<210> 8  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 8  
Tyr Leu Ser Lys Gly Arg Leu Val Phe Ala Leu Gly  
1 5 10

<210> 9  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 9  
Asn Asp Gly Lys Trp His Thr Val Val Phe Gly His  
1 5 10

<210> 10  
<211> 12  
<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 10

Gly Asn Ser Thr Ile Ser Ile Arg Ala Pro Val Tyr  
1 5 10

<210> 11

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 11

Thr Leu Phe Leu Ala His Gly Arg Leu Val Phe Met  
1 5 10

<210> 12

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 12

His Pro Asp Asp Phe Val Phe Tyr Val Gly Gly Tyr  
1 5 10

<210> 13

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 13

Trp Leu Tyr Val Asp Asp Gln Leu Gln Leu Val Lys  
1 5 10

<210> 14

45

<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 14  
Val Gln Ser Arg Gln His Ser Arg Ala Gly Gln Trp  
1 5 10

<210> 15  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 15  
Ala Gly Gln Trp His Arg Val Ser Val Arg Trp Gly  
1 5 10

<210> 16  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 16  
Val Arg Trp Gly Met Gln Gln Ile Gln Leu Val Val  
1 5 10

<210> 17  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 17  
Thr Trp Ser Gln Lys Ala Leu His His Arg Val Pro  
1 5 10

<210> 18  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 18  
Asp Gly Arg Trp His Arg Val Ala Val Ile Met Gly  
1 5 10

<210> 19  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 19  
Ala Pro Val Asn Val Thr Ala Ser Val Gln Ile Gln  
1 5 10

<210> 20  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 20  
Lys Pro Arg Leu Gln Phe Ser Leu Asp Ile Gln Thr  
1 5 10

<210> 21  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 21  
Arg Asn Arg Leu His Leu Ser Met Leu Val Arg Pro  
1 5 10

<210> 22  
<211> 12  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 22  
Ala Ala Ser Ile Lys Val Ala Val Ser Ala Asp Arg  
1 5 10

<210> 23  
<211> 12  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 23  
Ala Ser Phe Gly Phe Gln Thr Phe Gln Pro Ser Gly  
1 5 10

<210> 24  
<211> 12  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 24  
Phe Lys Leu Pro Gln Glu Leu Leu Lys Pro Arg Ser  
1 5 10

<210> 25  
<211> 12  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 25  
Lys Asn Ser Phe Met Ala Leu Tyr Leu Ser Lys Gly

1

5

10

<210> 26  
<211> 12  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 26  
Leu His Val Phe Tyr Asp Phe Gly Phe Ser Asn Gly  
1 5 10

<210> 27  
<211> 12  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 27  
Val Leu Val Arg Val Glu Arg Ala Thr Val Phe Ser  
1 5 10

<210> 28  
<211> 12  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 28  
Phe Leu Pro Leu Ala Leu Pro Asp Val Ala Pro Ile  
1 5 10

<210> 29  
<211> 12  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 29  
Gly Pro Leu Pro Ser Tyr Leu Gln Phe Val Gly Ile  
1 5 10

<210> 30  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 30  
Ser Val Gln Ile Gln Gly Ala Val Gly Met Arg Gly  
1 5 10

<210> 31  
<211> 416  
<212> PRT  
<213> Homo sapiens

<400> 31  
Val Val Arg Leu Asn Asp Thr Val Gly Val Thr Lys Lys Cys Ser Glu  
1 5 10 15

Asp Trp Lys Leu Val Arg Ser Ala Ser Phe Ser Arg Gly Gly Gln Leu  
20 25 30

Ser Phe Thr Asp Leu Gly Leu Pro Pro Thr Asp His Leu Gln Ala Ser  
35 40 45

Phe Gly Phe Gln Thr Phe Gln Pro Ser Gly Ile Leu Leu Asp His Gln  
50 55 60

Thr Trp Thr Arg Asn Leu Gln Val Thr Leu Glu Asp Gly Tyr Ile Glu  
65 70 75 80

Leu Ser Thr Ser Asp Ser Gly Gly Pro Ile Phe Lys Ser Pro Gln Thr  
85 90 95

Tyr Met Asp Gly Leu Leu His Tyr Val Ser Val Ile Ser Asp Asn Ser  
100 105 110

Gly Leu Arg Leu Leu Ile Asp Asp Gln Leu Leu Arg Asn Ser Lys Arg  
115 120 125

Leu Lys His Ile Ser Ser Ser Arg Gln Ser Leu Arg Leu Gly Gly Ser  
130 135 140

Asn Phe Glu Gly Cys Ile Ser Asn Val Phe Val Gln Arg Leu Ser Leu  
145 150 155 160

Ser Pro Glu Val Leu Asp Leu Thr Ser Asn Ser Leu Lys Arg Asp Val  
165 170 175

Ser Leu Gly Gly Cys Ser Leu Asn Lys Pro Pro Phe Leu Met Leu Leu  
180 185 190

Lys Gly Ser Thr Arg Phe Asn Lys Thr Lys Thr Phe Arg Ile Asn Gln  
195 200 205

Leu Leu Gln Asp Thr Pro Val Ala Ser Pro Arg Ser Val Lys Val Trp  
210 215 220

Gln Asp Ala Cys Ser Pro Leu Pro Lys Thr Gln Ala Asn His Gly Ala  
225 230 235 240

Leu Gln Phe Gly Asp Ile Pro Thr Ser His Leu Leu Phe Lys Leu Pro  
245 250 255

Gln Glu Leu Leu Lys Pro Arg Ser Gln Phe Ala Val Asp Met Gln Thr  
260 265 270

Thr Ser Ser Arg Gly Leu Val Phe His Thr Gly Thr Lys Asn Ser Phe  
275 280 285

Met Ala Leu Tyr Leu Ser Lys Gly Arg Leu Val Phe Ala Leu Gly Thr  
290 295 300

Asp Gly Lys Lys Leu Arg Ile Lys Ser Lys Glu Lys Cys Asn Asp Gly  
305 310 315 320

Lys Trp His Thr Val Val Phe Gly His Asp Gly Glu Lys Gly Arg Leu  
325 330 335

Val Val Asp Gly Leu Arg Ala Arg Glu Gly Ser Leu Pro Gly Asn Ser  
340 345 350

Thr Ile Ser Ile Arg Ala Pro Val Tyr Leu Gly Ser Pro Pro Ser Gly  
355 360 365

Lys Pro Lys Ser Leu Pro Thr Asn Ser Phe Val Gly Cys Leu Lys Asn  
370 375 380

Phe Gln Leu Asp Ser Lys Pro Leu Tyr Thr Pro Ser Ser Ser Phe Gly  
385 390 395 400

Val Ser Ser Cys Leu Gly Gly Pro Leu Glu Lys Gly Ile Tyr Phe Ser  
405 410 415

<210> 32  
<211> 964  
<212> PRT  
<213> Mus musculus

<400> 32

Thr Ser Ile Ser Leu Tyr Met Lys Pro Pro Pro Lys Pro Gln Thr Thr  
1 5 10 15

Gly Ala Trp Val Ala Asp Gln Phe Val Leu Tyr Leu Gly Ser Lys Asn  
20 25 30

Ala Lys Lys Glu Tyr Met Gly Leu Ala Ile Lys Asn Asp Asn Leu Val  
35 40 45

Tyr Val Tyr Asn Leu Gly Met Lys Asp Val Glu Ile Leu Leu Asp Ser  
50 55 60

Lys Pro Val Ser Ser Trp Pro Ala Tyr Phe Ser Ile Val Lys Ile Glu  
65 70 75 80

Arg Val Gly Lys His Gly Lys Val Phe Leu Thr Val Pro Ser Ser Ser  
85 90 95

Ser Thr Ala Glu Glu Lys Phe Ile Lys Lys Gly Glu Phe Ala Gly Asp  
100 105 110

Asp Ser Leu Leu Asp Leu Thr Pro Glu Asp Thr Val Phe Tyr Val Gly  
115 120 125

Gly Val Pro Ala Asn Phe Lys Leu Pro Ala Ser Leu Asn Leu Pro Ser  
130 135 140

Tyr Ser Gly Cys Leu Glu Leu Ala Thr Leu Asn Asn Asp Val Ile Ser  
145 150 155 160

Leu Tyr Asn Phe Lys His Ile Tyr Asn Met Asp Pro Ser Lys Ser Val  
165 170 175

Pro Cys Ala Arg Asp Lys Leu Ala Phe Thr Gln Ser Arg Ala Ala Ser  
180 185 190

Tyr Phe Phe Asp Gly Ser Ser Tyr Ala Val Val Arg Asp Ile Thr Arg  
195 200 205

Arg Gly Lys Phe Gly Gln Val Thr Arg Phe Asp Ile Glu Ile Arg Thr  
210 215 220

Pro Ala Asp Asn Gly Leu Val Leu Leu Met Val Asn Gly Ser Met Phe  
225 230 235 240

Phe Ser Leu Glu Met Arg Asn Gly Tyr Leu His Val Phe Tyr Asp Phe  
245 250 255

Gly Phe Ser Asn Gly Pro Val His Leu Glu Asp Thr Leu Lys Lys Ala  
260 265 270

Gln Ile Asn Asp Ala Lys Tyr Arg Glu Ile Ser Ile Ile Tyr His Asn  
275 280 285

Asp Lys Lys Met Ile Leu Val Val Asp Arg Arg His Val Lys Ser Thr  
290 295 300

Asp Asn Glu Lys Lys Lys Ile Pro Phe Thr Asp Ile Tyr Ile Gly Gly  
305 310 315 320

Ala Pro Gln Glu Val Leu Gln Ser Arg Thr Leu Arg Ala His Leu Pro  
325 330 335

Leu Asp Ile Asn Phe Arg Gly Cys Met Lys Gly Ile Gln Phe Gln Lys  
340 345 350

Lys Asp Phe Asn Leu Leu Glu Gln Thr Glu Thr Leu Gly Val Gly Tyr  
355 360 365

Gly Cys Pro Glu Asp Ser Leu Ile Ser Arg Arg Ala Tyr Phe Asn Gly  
370 375 380

Gln Ser Phe Ile Ala Ser Ile Gln Lys Ile Ser Phe Phe Asp Gly Phe  
385 390 395 400

Glu Gly Gly Phe Asn Phe Arg Thr Leu Gln Pro Asn Gly Leu Leu Phe  
405 410 415

Tyr Tyr Thr Ser Gly Ser Asp Val Phe Ser Ile Ser Leu Asp Asn Gly  
420 425 430

Thr Val Val Met Asp Val Lys Gly Ile Lys Val Met Ser Thr Asp Lys  
435 440 445

Gln Tyr His Asp Gly Leu Pro His Phe Val Val Thr Ser Ile Ser Asp  
450 455 460

Thr Arg Tyr Glu Leu Val Val Asp Lys Ser Arg Leu Arg Gly Lys Asn  
465 470 475 480

Pro Thr Lys Gly Lys Ala Glu Gln Thr Gln Thr Thr Glu Lys Lys Phe  
485 490 495

Tyr Phe Gly Gly Ser Pro Ile Ser Pro Gln Tyr Ala Asn Phe Thr Gly  
500 505 510

Cys Ile Ser Asn Ala Tyr Phe Thr Arg Leu Asp Arg Asp Val Glu Val  
515 520 525

Glu Ala Phe Gln Arg Tyr Ser Glu Lys Val His Thr Ser Leu Tyr Glu  
530 535 540

Cys Pro Ile Glu Ser Ser Pro Leu Phe Leu Leu His Lys Lys Gly Lys  
545 550 555 560

Asn Ser Ser Lys Pro Lys Thr Asn Lys Gln Gly Glu Lys Ser Lys Asp  
565 570 575

Ala Pro Ser Trp Asp Pro Ile Gly Leu Lys Phe Leu Glu Gln Lys Ala  
580 585 590

Pro Arg Asp Ser His Cys His Leu Phe Ser Ser Pro Arg Ala Ile Glu  
595 600 605

His Ala Tyr Gln Tyr Gly Gly Thr Ala Asn Ser Arg Gln Glu Phe Glu  
610 615 620

His Glu Gln Gly Asp Phe Gly Glu Lys Ser Gln Phe Ser Ile Arg Leu  
625 630 635 640

Lys Thr Arg Ser Ser His Gly Met Ile Phe Tyr Val Ser Asp Gln Glu  
645 650 655

Glu Asn Asp Phe Met Thr Leu Phe Leu Ala His Gly Arg Leu Val Phe  
660 665 670

Met Phe Asn Val Gly His Lys Lys Leu Lys Ile Arg Ser Gln Glu Lys  
675 680 685

Tyr Asn Asp Gly Leu Trp His Asp Val Ile Phe Ile Arg Glu Lys Ser  
690 695 700

Ser Gly Arg Leu Val Ile Asp Gly Leu Arg Val Leu Glu Glu Arg Leu  
705 710 715 720

Pro Pro Ser Gly Ala Ala Trp Lys Ile Lys Gly Pro Ile Tyr Leu Gly  
725 730 735

Gly Val Ala Pro Gly Arg Ala Val Lys Asn Val Gln Ile Thr Ser Val  
740 745 750

Tyr Ser Phe Ser Gly Cys Leu Gly Asn Leu Gln Leu Asn Gly Ala Ser  
755 760 765

Ile Thr Ser Ala Ser Gln Thr Phe Ser Val Thr Pro Cys Phe Glu Gly  
770 775 780

Pro Met Glu Thr Gly Thr Tyr Phe Ser Thr Glu Gly Gly Tyr Val Val  
785 790 795 800

Leu Asp Glu Ser Phe Asn Ile Gly Leu Lys Phe Glu Ile Ala Phe Glu  
805 810 815

Val Arg Pro Arg Ser Ser Ser Gly Thr Leu Val His Gly His Ser Val  
820 825 830

Asn Gly Glu Tyr Leu Asn Val His Met Arg Asn Gly Gln Val Ile Val  
835 840 845

Lys Val Asn Asn Gly Val Arg Asp Phe Ser Thr Ser Val Thr Pro Lys  
850 855 860

Gln Asn Leu Cys Asp Gly Arg Trp His Arg Ile Thr Val Ile Arg Asp  
865 870 875 880

Ser Asn Val Val Gln Leu Asp Val Asp Ser Glu Val Asn His Val Val  
885 890 895

Gly Pro Leu Asn Pro Lys Pro Val Asp His Arg Glu Pro Val Phe Val  
900 905 910

Gly Gly Val Pro Glu Ser Leu Leu Thr Pro Arg Leu Ala Pro Ser Lys  
915 920 925

Pro Phe Thr Gly Cys Ile Arg His Phe Val Ile Asp Ser Arg Pro Val  
930 935 940

Ser Phe Ser Lys Ala Ala Leu Val Ser Gly Ala Val Ser Ile Asn Ser  
945 950 955 960

Cys Pro Thr Ala

<210> 33

<211> 956

<212> PRT

<213> Mus musculus

<400> 33

Thr Ala Leu Lys Phe His Ile Gln Ser Pro Val Pro Ala Pro Glu Pro  
1 5 10 15

Gly Lys Asn Thr Gly Asp His Phe Val Leu Tyr Met Gly Ser Arg Gln  
20 25 30

Ala Thr Gly Asp Tyr Met Gly Val Ser Leu Arg Asn Gln Lys Val His  
35 40 45

Trp Val Tyr Arg Leu Gly Lys Ala Gly Pro Thr Thr Leu Ser Ile Asp  
50 55 60

Glu Asn Ile Gly Glu Gln Phe Ala Ala Val Ser Ile Asp Arg Thr Leu  
65 70 75 80

Gln Phe Gly His Met Ser Val Thr Val Glu Lys Gln Met Val His Glu  
85 90 95

Ile Lys Gly Asp Thr Val Ala Pro Gly Ser Glu Gly Leu Leu Asn Leu  
100 105 110

His Pro Asp Asp Phe Val Phe Tyr Val Gly Gly Tyr Pro Ser Asn Phe  
115 120 125

Thr Pro Pro Glu Pro Leu Arg Phe Pro Gly Tyr Leu Gly Cys Ile Glu  
130 135 140

Met Glu Thr Leu Asn Glu Glu Val Val Ser Leu Tyr Asn Phe Glu Gln  
145 150 155 160

Thr Phe Met Leu Asp Thr Ala Val Asp Lys Pro Cys Ala Arg Ser Lys  
165 170 175

Ala Thr Gly Asp Pro Trp Leu Thr Asp Gly Ser Tyr Leu Asp Gly Ser  
180 185 190

Gly Phe Ala Arg Ile Ser Phe Glu Lys Gln Phe Ser Asn Thr Lys Arg  
195 200 205

Phe Asp Gln Glu Leu Arg Leu Val Ser Tyr Asn Gly Ile Ile Phe Phe  
210 215 220

Leu Lys Gln Glu Ser Gln Phe Leu Cys Leu Ala Val Gln Glu Gly Thr  
225 230 235 240

Leu Val Leu Phe Tyr Asp Phe Gly Ser Gly Leu Lys Lys Ala Asp Pro  
245 250 255

Leu Gln Pro Pro Gln Ala Leu Thr Ala Ala Ser Lys Ala Ile Gln Val  
260 265 270

Phe Leu Leu Ala Gly Asn Arg Lys Arg Val Leu Val Arg Val Glu Arg  
275 280 285

Ala Thr Val Phe Ser Val Asp Gln Asp Asn Met Leu Glu Met Ala Asp  
290 295 300

Ala Tyr Tyr Leu Gly Gly Val Pro Pro Glu Gln Leu Pro Leu Ser Leu  
305 310 315 320

Arg Gln Leu Phe Pro Ser Gly Gly Ser Val Arg Gly Cys Ile Lys Gly  
325 330 335

Ile Lys Ala Leu Gly Lys Tyr Val Asp Leu Lys Arg Leu Asn Thr Thr  
340 345 350

Gly Ile Ser Phe Gly Cys Thr Ala Asp Leu Leu Val Gly Arg Thr Met  
355 360 365

Thr Phe His Gly His Gly Phe Leu Pro Leu Ala Leu Pro Asn Val Ala  
370 375 380

Pro Ile Thr Glu Val Val Tyr Ser Gly Phe Gly Phe Arg Gly Thr Gln  
385 390 395 400

Asp Asn Asn Leu Leu Tyr Tyr Arg Thr Ser Pro Asp Gly Pro Tyr Gln  
405 410 415

Val Ser Leu Arg Glu Gly His Val Thr Leu Arg Phe Met Asn Gln Glu  
420 425 430

Val Glu Thr Gln Arg Val Phe Ala Asp Gly Ala Pro His Tyr Val Ala  
435 440 445

Phe Tyr Ser Asn Val Thr Gly Val Trp Leu Tyr Val Asp Asp Gln Leu  
450 455 460

Gln Leu Val Lys Ser His Glu Arg Thr Thr Pro Met Leu Gln Leu Gln  
465 470 475 480

Pro Glu Glu Pro Ser Arg Leu Leu Leu Gly Gly Leu Pro Val Ser Gly  
485 490 495

Thr Phe His Asn Phe Ser Gly Cys Ile Ser Asn Val Phe Val Gln Arg  
500 505 510

Leu Arg Gly Pro Gln Arg Val Phe Asp Leu His Gln Asn Met Gly Ser  
515 520 525

Val Asn Val Ser Val Gly Cys Thr Pro Ala Gln Leu Ile Glu Thr Ser  
530 535 540

Arg Ala Thr Ala Gln Lys Val Ser Arg Arg Ser Arg Gln Pro Ser Gln  
545 550 555 560

Asp Leu Ala Cys Thr Thr Pro Trp Leu Pro Gly Thr Ile Gln Asp Ala  
565 570 575

Tyr Gln Phe Gly Gly Pro Leu Pro Ser Tyr Leu Gln Phe Val Gly Ile  
580 585 590

Ser Pro Ser His Arg Asn Arg Leu His Leu Ser Met Leu Val Arg Pro  
595 600 605

His Ala Ala Ser Gln Gly Leu Leu Leu Ser Thr Ala Pro Met Ser Gly  
610 615 620

Arg Ser Pro Ser Leu Val Leu Phe Leu Asn His Gly His Phe Val Ala  
625 630 635 640

Gln Thr Glu Gly Pro Gly Pro Arg Leu Gln Val Gln Ser Arg Gln His  
645 650 655

Ser Arg Ala Gly Gln Trp His Arg Val Ser Val Arg Trp Gly Met Gln  
660 665 670

Gln Ile Gln Leu Val Val Asp Gly Ser Gln Thr Trp Ser Gln Lys Ala  
675 680 685

Leu His His Arg Val Pro Arg Ala Glu Arg Pro Gln Pro Tyr Thr Leu  
690 695 700

Ser Val Gly Gly Leu Pro Ala Ser Ser Tyr Ser Ser Lys Leu Pro Val  
705 710 715 720

Ser Val Gly Phe Ser Gly Cys Leu Lys Lys Leu Gln Leu Asp Lys Gln  
725 730 735

Pro Leu Arg Thr Pro Thr Gln Met Val Gly Val Thr Pro Cys Val Ser  
740 745 750

Gly Pro Leu Glu Asp Gly Leu Phe Phe Pro Gly Ser Glu Gly Val Val  
755 760 765

Thr Leu Glu Leu Pro Lys Ala Lys Met Pro Tyr Val Ser Leu Glu Leu  
770 775 780

Glu Met Arg Pro Leu Ala Ala Gly Leu Ile Phe His Leu Gly Gln  
785 790 795 800

Ala Leu Ala Thr Pro Tyr Met Gln Leu Lys Val Leu Thr Glu Gln Val  
805 810 815

Leu Leu Gln Ala Asn Asp Gly Ala Gly Glu Phe Ser Thr Trp Val Thr  
820 825 830

Tyr Pro Lys Leu Cys Asp Gly Arg Trp His Arg Val Ala Val Ile Met  
835 840 845

Gly Arg Asp Thr Leu Arg Leu Glu Val Asp Thr Gln Ser Asn His Thr  
850 855 860

Thr Gly Arg Leu Pro Glu Ser Leu Ala Gly Ser Pro Ala Leu Leu His  
865 870 875 880

Leu Gly Ser Leu Pro Lys Ser Ser Thr Ala Arg Pro Glu Leu Pro Ala  
885 890 895

Tyr Arg Gly Cys Leu Arg Lys Leu Leu Ile Asn Gly Ala Pro Val Asn  
900 905 910

Val Thr Ala Ser Val Gln Ile Gln Gly Ala Val Gly Met Arg Gly Cys  
915 920 925

Pro Ser Gly Thr Leu Ala Leu Ser Lys Gln Gly Lys Ala Leu Thr Gln  
930 935 940

Arg His Ala Lys Pro Ser Val Ser Pro Leu Leu His  
945 950 955

<210> 34

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 34  
Thr Arg Ile Ser Leu Gln Val Gln Leu Arg Lys Arg  
1 5 10

<210> 35  
<211> 13  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 35  
Ala Lys Ile Ile Ile Tyr Ala Val Gln Phe Val Gln Arg  
1 5 10

<210> 36  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 36  
Gly Leu Ala Phe Val Leu Arg Gly Lys Ser Leu Tyr  
1 5 10

<210> 37  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 37  
Met Phe Val Leu Arg Gly His Ala Leu Phe Leu Thr  
1 5 10

<210> 38  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic

peptide

<400> 38  
Gly Trp Arg Val Ser Val Arg His Trp Gln Gly Ala  
1 5 10

<210> 39  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 39  
Gly Met Ile Val Ala Val Arg His Trp Arg Gly Asp  
1 5 10

<210> 40  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 40  
Thr Leu Phe Phe Met Arg Leu Val His Ala Leu Gly  
1 5 10

<210> 41  
<211> 5  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 41  
Leu Pro Phe Phe Asp  
1 5

<210> 42  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 42  
Ala Gly Gln Trp His Arg Val  
1 5

<210> 43  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 43  
Gly Gln Trp His Arg Val Ser  
1 5

<210> 44  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 44  
Gln Trp His Arg Val Ser Val  
1 5

<210> 45  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 45  
Trp His Arg Val Ser Val Arg  
1 5

<210> 46  
<211> 7  
<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 46

His Arg Val Ser Val Arg Trp  
1 . . . . 5

<210> 47

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 47

Arg Val Ser Val Arg Trp Gly  
1 . . . . 5

<210> 48

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 48

Asp Gly Arg Trp His Arg Val  
1 . . . . 5

<210> 49

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 49

Gly Arg Trp His Arg Val Ala  
1 . . . . 5

<210> 50

<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 50  
Arg Trp His Arg Val Ala Val  
1 5

<210> 51  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 51  
Trp His Arg Val Ala Val Ile  
1 5

<210> 52  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 52  
His Arg Val Ala Val Ile Met  
1 5

<210> 53  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 53  
Arg Val Ala Val Ile Met Gly  
1 5

<210> 54  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 54  
Thr Leu Phe Leu Ala His Gly  
1 5

<210> 55  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 55  
Leu Phe Leu Ala His Gly Arg  
1 5

<210> 56  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 56  
Phe Leu Ala His Gly Arg Leu  
1 5

<210> 57  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 57  
Leu Ala His Gly Arg Leu Val  
1 5

<210> 58  
<211> 7  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 58  
Ala His Gly Arg Leu Val Phe  
1 5

<210> 59  
<211> 7  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 59  
His Gly Arg Leu Val Phe Met  
1 5

<210> 60  
<211> 7  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 60  
Gly Leu Ala Phe Val Leu Arg  
1 5

<210> 61  
<211> 7  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide  
  
<400> 61  
Leu Ala Phe Val Leu Arg Gly

<210> 62  
<211> 7  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 62  
Ala Phe Val Leu Arg Gly Lys  
1 5

<210> 63  
<211> 7  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 63  
Phe Val Leu Arg Gly Lys Ser  
1 5

<210> 64  
<211> 7  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 64  
Val Leu Arg Gly Lys Ser Leu  
1 5

<210> 65  
<211> 7  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 65  
Leu Arg Gly Lys Ser Leu Tyr  
1 5

<210> 66  
<211> 8  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 66  
Arg Lys Arg Leu Gln Val Gln Tyr  
1 5

<210> 67  
<211> 8  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 67  
Lys Arg Leu Gln Val Gln Leu Tyr  
1 5

<210> 68  
<211> 8  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 68  
Arg Leu Gln Val Gln Leu Ser Tyr  
1 5

<210> 69  
<211> 8  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic

peptide

<400> 69  
Leu Gln Val Gln Leu Ser Ile Tyr  
1 5

<210> 70  
<211> 8  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 70  
Gln Val Gln Leu Ser Ile Arg Tyr  
1 5

<210> 71  
<211> 8  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 71  
Val Gln Leu Ser Ile Arg Thr Tyr  
1 5

<210> 72  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 72  
Arg Gln Val Phe Gln Val Ala  
1 5

<210> 73  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 73  
Gln Val Phe Gln Val Ala Tyr  
1 5

<210> 74  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 74  
Val Phe Gln Val Ala Tyr Ile  
1 5

<210> 75  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 75  
Phe Gln Val Ala Tyr Ile Ile  
1 5

<210> 76  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 76  
Gln Val Ala Tyr Ile Ile Ile  
1 5

<210> 77  
<211> 7  
<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 77

Val Ala Tyr Ile Ile Ile Lys  
1 5

<210> 78

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 78

Ala Tyr Ile Ile Ile Lys Ala  
1 5

<210> 79

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 79

Tyr Leu Ser Lys Gly Arg Leu Tyr  
1 5

<210> 80

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 80

Leu Ser Lys Gly Arg Leu Val Tyr  
1 5

<210> 81

<211> 8  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 81  
Ser Lys Gly Arg Leu Val Phe Tyr  
1 5

<210> 82  
<211> 8  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 82  
Lys Gly Arg Leu Val Phe Ala Tyr  
1 5

<210> 83  
<211> 8  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 83  
Gly Arg Leu Val Phe Ala Leu Tyr  
1 5

<210> 84  
<211> 8  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 84  
Arg Leu Val Phe Ala Leu Gly Tyr  
1 5

<210> 85  
<211> 8  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 85  
Thr Leu Phe Leu Ala His Gly Tyr  
1 5

<210> 86  
<211> 8  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 86  
Leu Phe Leu Ala His Gly Arg Tyr  
1 5

<210> 87  
<211> 8  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 87  
Phe Leu Ala His Gly Arg Leu Tyr  
1 5

<210> 88  
<211> 8  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 88  
Leu Ala His Gly Arg Leu Val Tyr  
1 5

<210> 89  
<211> 8  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 89  
Ala His Gly Arg Leu Val Phe Tyr  
1 5

<210> 90  
<211> 8  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 90  
His Gly Arg Leu Val Phe Met Tyr  
1 5

<210> 91  
<211> 8  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 91  
Ala Gly Gln Trp His Arg Val Tyr  
1 5

<210> 92  
<211> 8  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide  
  
<400> 92  
Gly Gln Trp His Arg Val Ser Tyr

<210> 93  
<211> 8  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 93  
Gln Trp His Arg Val Ser Val Tyr  
1 5

<210> 94  
<211> 8  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 94  
Trp His Arg Val Ser Val Arg Tyr  
1 5

<210> 95  
<211> 8  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 95  
His Arg Val Ser Val Arg Trp Tyr  
1 5

<210> 96  
<211> 8  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 96  
Arg Val Ser Val Arg Trp Gly Tyr  
1 5

<210> 97  
<211> 8  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 97  
Asp Gly Arg Trp His Arg Val Tyr  
1 5

<210> 98  
<211> 8  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 98  
Gly Arg Trp His Arg Val Ala Tyr  
1 5

<210> 99  
<211> 8  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 99  
Arg Trp His Arg Val Ala Val Tyr  
1 5

<210> 100  
<211> 8  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic

peptide

<400> 100  
Trp His Arg Val Ala Val Ile Tyr  
1 5

<210> 101  
<211> 8  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 101  
His Arg Val Ala Val Ile Met Tyr  
1 5

<210> 102  
<211> 8  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 102  
Arg Val Ala Val Ile Met Gly Tyr  
1 5

<210> 103  
<211> 8  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 103  
Gly Leu Ala Phe Val Leu Arg Tyr  
1 5

<210> 104  
<211> 8  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 104  
Leu Ala Phe Val Leu Arg Gly Tyr  
1 5

<210> 105  
<211> 8  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 105  
Ala Phe Val Leu Arg Gly Lys Tyr  
1 5

<210> 106  
<211> 8  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 106  
Phe Val Leu Arg Gly Lys Ser Tyr  
1 5

<210> 107  
<211> 8  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 107  
Val Leu Arg Gly Lys Ser Leu Tyr  
1 5

<210> 108  
<211> 8  
<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 108

Leu Arg Gly Lys Ser Leu Tyr Tyr  
1 5